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RED GAINS 'PHENOMENAL'**U.S. Looks to Soviet Way:
in Race for More Scientists**

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EAST ORANGE, N.J., Nov. 20

—America, with all its technical know-how, may yet have to borrow heavily from Russia's bag of pedagogical tricks to produce the scientists and engineers this nation urgently requires.

This was conceded today by educators, industrialists and government representative participating in an institute called by the Thomas Alva Edison Foundation to plan "Strengthening Science Education for Youth and Industry."

Highlight of the conference was the panel discussion of the Russian educational system whose growth during the last 20

years was described as "phenomenal."

PUPILS REWARDED

Dr. Herbert Scoville Jr., assistant director of the U.S. Central Intelligence Agency, attributed Russia's accelerated production of trained manpower to three factors: control of the secondary curriculum and enrollment by the state; rewards offered to youngsters preparing for careers in science; and the vast upgrading of the teaching profession both socially and economically.

Scoville said that Soviet education has been keyed to produce scientists. Three-quarters of all Russian youths graduate from the 10th grade. All are exposed early to the basic sciences with-

out choice of electives. The cream of the crop is funneled into the universities for an intensive five-year course; the others, less talented, are trained as technicians.

"Scholarships are given to all who can qualify," Scoville said. "These are graduated in amount, depending on the course of study selected and on how badly specialists in a particular field may be required. In the United States, we feel that all must be treated alike. Not only is tuition free in Russia but students receive a wage comparable to that paid the average worker in industry."

60 PCT. TEACH

"Sixty per cent of university graduates go into teaching. Their training has been given the highest priority. Much honor and social prestige attach to the profession."

"A junior professor receives 4,000 rubles a month or about 10 times the amount paid an industrial worker."

The universities and the pedagogical institutes offer degrees in both education and science. Unlike the United States, where a trained teacher may chance or choose to instruct in science often without sufficient background, Russia demands a professional scientist who is assigned to teach.

"Moreover, teachers are not allowed to stagnate. They are required to take a competitive examination every five years to demonstrate their proficiency—and to hold their jobs."

Participants in the panel discussion, who have studied the Soviet school system recently, reported that release from the straitjacket of Stalinism has introduced a new note of informality in classrooms. For the first time students are encouraged to take nothing for granted, to raise questions, to argue with their instructors.

HALF ARE WOMEN

Argument was said to be assured by the fact that about one-half of all university students are women. More than one-third of all medical school graduates.

The question was raised about

Dr. John Turkevich, research professor of chemistry at Princeton University, replied that they were "among the best in the world."

He said, "there is a text on chemistry which is superb. I would not think of lecturing to my class of 300 students without first reading the appropriate chapter in that book."

"Russia is flooded with excellent, inexpensive texts. In this country, publishers continually urge us to 'cut it down'; in Russia, text writers are requested to engage in exhaustive dissertations—and they are paid by the page."

'REBEL DANGEROUS'

Turkevich, born in the United States of Russian parents, held that the great advances in science have come from "creative research" and that the political climate of Russia has not been conducive to such endeavors.

He asserted: "The creative man is a rebel and it has been dangerous to be a rebel in Russia, until the recent downgrading of Stalin. Now the story may be different."

"The Soviet is strong in mathematics, which suffered least modification by Marxian doctrine. It is weakest in biology and biochemistry because of the party line. It has shown some cases of genius in mathematical

physics and has built the biggest, best and fastest electronic brain on the continent. It has one outstanding scientist in astrophysics."

"It is largely an imitator in nuclear power reactors but it will have several in operation before the United States. Our six bil-

lion electron volt accelerator at the California Institute of Technology, with its 9,000-ton magnet, will be dwarfed by the Soviet's 50 billion volt machine with a 36,000-ton magnet—and they are planning another of 50 billion electron volts."